HEALTH CONSULTATION

TOLEDO TIE TREATMENT SITE

TOLEDO, LUCAS COUNTY, OHIO

CERCLIS NO. OHD987049202

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Prepared by

Ohio Department of Health
Bureau of Environmental Health and Toxicology
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

BACKGROUND AND STATEMENT OF ISSUES

The United States Environmental Protection Agency (U.S.EPA) asked the Ohio Department of Health (ODH) and the Agency For Toxic Substances and Disease Registry (ATSDR) to evaluate the potential health risks associated with the Toledo Tie Treatment site in Toledo, Ohio. This health consultation was prepared by the Ohio Department of Health under cooperative agreement with ATSDR

The Toledo Tie Treatment site is in a commercial-industrial portion of southwestern Toledo, Lucas County, Ohio (Figure 1). The former creosote treatment facility is at the southeast corner of the junction of Arco Drive and Frenchman's Road, north of the Conrail Railroad tracks. The site is bounded on the south by the railroad tracks, Arco Drive on the west, Williams Ditch on the north, and on the east by the Toledo Railroad Terminal (Figure 2). Because of regional groundwater contamination, the City of Toledo has prohibited the use of groundwater for drinking water.

The site includes areas formerly used by the American Creosoting Company and the New York Central Railroad for the treatment and storage of railroad ties. The site originally encompassed 50 acres owned by the Federal Creosoting Company which operated at the site from 1923 to 1959. The facility was transferred to the American Creosoting Company who then sold the property to the city of Toledo in 1962 (Ohio EPA, 1993). The property was purchased by Arco Inc. in 1969 for development into an industrial park.

ODH staff Tracy Shelley and Bob Frey, visited the Toledo Tie Treatment site on June 27, 1995. Much of the site, including the former creosote tank area and former lagoon area, is now a level, empty grass and shrub-covered lot. Part of the site has been developed as an industrial park with several small industrial and commercial businesses. Businesses located on the site include Spartan Chemical plant on the south side of Frenchmans Road, Ohio Lottery, Wilkins Pipeyard, and Toledo Cutting Tools properties on the east side of Arco Drive (Figure 2).

Access to the site is unlimited. The former lagoon area at the corner of Arco Drive and Frenchmans Road is now a grass-covered, level, empty lot. Piles of dirt and remnants of a concrete foundation were noted in the empty lot east of the Ohio Lottery building and north of the pipeyard (Figure 2). Soil on-site is dark black, fine-grained, and poorly-drained. We noted a recent excavation south of and adjacent to the Ohio Lottery building that had exposed the upper 1-2 feet of soil. Wilkins Pipeyard is surrounded by a 6-foot high chain-link fence topped with barbed wire which encloses stockpiles of pipes of various size and composition. There is a large level area to the east of the pipeyard with bare patches of ground, revealing black-brown, oil-stained soil and cinders. The former creosote tank area is covered with a dense cover of shrubs and small trees.

Just north of Frenchmans Road, adjacent to an operating printing facility, Williams Ditch flows northeast across a vacant lot to the north of the site (Figure 2). In the vicinity of Arco

Drive and Frenchmans Road, the ditch is a slow-moving, stagnant ditch, about 10-15 feet wide and 1-2 feet deep. The banks are weed-covered or partially covered with rock or concrete rip-rap. Northeast of Hill Avenue, the ditch is culverted and dips out of sight. It re-emerges north of Nebraska Avenue and then disappears again beneath Toledo until it enters the Ottawa River, 2-2 ½ miles northeast of the site. At the time of the site visit, the ditch was cloudy and turbid and had an oily sheen on the surface of the water. There was also a faint creosote odor in the air. The oily material seemed to be coming from the base of the south and east banks of the ditch. No fish or other aquatic organisms were observed in the ditch.

There are about 75 to 100 people working in businesses around the site. The closest residential area is about 1/4 of a mile south of the site, south of the South Avenue. There are a few scattered single-family residences and an apartment complex on the north side of Hill Avenue, 1/4 of a mile north and northeast of the site.

Overall, the demographic profile for the area surrounding the Toledo Tie Site indicates a community that is slightly depressed economically compared to Lucas County as a whole or compared to the State of Ohio. Median family income, median housing value, and median rent are all lower for this area and unemployment is higher (Table 1).

There are approximately 4,079 people living in the area surrounding the Toledo Tie site. The area of concern is defined by Hill Avenue to the North, Fearing Blvd. to the East, Airport Highway to the south, and "Y" street to the west. The entire area is considered urban and the people comprise 1,069 families, 1,658 households, and occupy 1,658 housing units. The population is predominantly white (Table 1).

When the site was used for creosote treatment, there were several buildings and above-ground storage tanks on site. Storage capacity included two 500,000 gallon, four 150,000 gallon, and three 30,000 gallon creosote tanks, and one 150,000 gallon zinc-chloride tank. Five to 10 acres of the site, east of the former creosote tank area was used for drying and storage of the creosote-treated ties (Figure 2). Aerial photographs taken in 1962 (Ohio EPA, 1993) showed two of the former creosote lagoons, located south of Frenchmans Road and east of Arco Drive (Figure 2). There is little or no information about the history of these lagoons and the materials stored in them (Personal Communication, A. Lundsey, Ohio EPA, 1995).

A number of on-site investigations have been performed over the course of the last decade. These investigations have shown that on-site soils were contaminated with creosote products, including a variety of polycyclic aromatic hydrocarbons (PAHs). The first investigations took place in March and June of 1990. In March of 1990, Geraghty and Miller, Inc. undertook an investigation of the soil pile at the site (Figure 3). The pile was about 1.3 acres in size and consisted of fine grained soils, demolition debris, and railroad ties. Investigators noted a tar-like odor and soft tar at the pile. The soil pile may have been the

TABLE 1
DEMOGRAPHIC PROFILE SURROUNDING
TOLEDO TIE TREATMENT
1990 CENSUS DATA

	State of Ohio	Lucas County	Area of Concern
Race			
White	87.8	82.3	85.8
Black	10.6	14.8	11.0
Other	1.6	2.9	3.2
Education			
% H.S. Grad	75.7	76.2	68.8
Labor			
% in Labor Force	63.5	63.5	58.3
% Unemployed	6.6	8.5	10.6
Median Family Income	$34,351.00	$35,130.00	$31,560.00
Poverty			
% Families Below	9.7	12.0	13.2
Residency			
since 1985	83.2	53.2	59.1
Tenure			
Owned	52.1	57.7	55.0
Rented	29.6	34.7	32.8
Median Housing Value	$62,900.00	$56,500.00	$41,183.00
Median Gross Rent	$379.00	$390.00	$330.00
Information taken from Census of Population and Housing STF3A, 1990			

approximate location of the storage tank farm. Sampling demonstrated the presence of organic materials mixed with the soil (Geraghty and Miller, 1990). In June of 1990, Midwest Consultants conducted a site investigation and preliminary risk assessment at the property in order to determine the extent of soil and groundwater contamination. Four monitoring wells were installed at the four corners of the property. Soil samples were collected from the borings as the monitoring wells were drilled. One additional subsurface soil sample was collected at the property. Phenanthrene, a PAH, was slightly elevated in one of the samples. Arsenic was above the screening level of 10 micrograms per liter (μg/L) in all four groundwater samples. Concentrations of arsenic ranged from 16 to 230 μg/L. Chromium was elevated in one of the samples.

Ohio EPA completed an investigation in March 1993 to determine the extent of soil, surface water, and sediment contamination at the site. Soil samples were collected from one to five feet in depth from four on-site areas, one area next to Williams Ditch, and one background area. Investigators noted that soils in the former creosote lagoons were saturated with an oily, tar-like material. None of the soil samples represent surface (0-3 inches) samples. Sample results indicated that two areas on site, the former lagoon area and the waste pile, were contaminated with PAHs (Table 2). The sample collected next to Williams Ditch also contained PAHs, but concentrations were much lower than the on-site locations (Figure 3).

Several volatile organic compound (VOCs) were also present in on-site soils. Benzene, toluene, xylene, and styrene concentrations were below 1.0 micrograms per kilogram (mg/kg) or parts per million which are much lower than soil screening levels. Benzo (a) pyrene was present in two of four on-site sample stations and next to Williams Ditch at levels above the cancer risk screening level. Phenanthrene was the only other PAH detected at concentrations close to the soil screening level. The highest concentration of contamination was found at 2-3 feet below the surface in the former creosote lagoon area and near Williams Ditch (Figure 2).

TABLE 2
ON-SITE SUBSURFACE SOIL SAMPLES

CHEMICAL	CONCENTRATION (mg/kg)	SCREENING VALUE (mg/kg)
Naphthalene	ND-3,700D	28,000[1]
2-methylnaphthalene	ND-760	NA
Phenanthrene	ND-2,000	2,800[1]
Carbazole	ND-150	NA
Fluoranthene	ND-1,300	28,000[1]
Benzo (a) anthracene	ND-300	NA
Chrysene	ND-240	NA
Pyrene	ND-870	21,000[1]
Benzo (b) fluoranthene	ND-340	NA
Benzo(a) pyrene	**ND-150**	**1.0[2]**
Indeno(1,2,3-cd)pyrene	ND-90	NA

(Ohio EPA, 1993) 1=ODH calculated non cancer screening level
2=ODH calculated cancer screening level ND=Chemical not detected NA=None Available

Two surface water and sediment samples were collected from Williams Ditch (Figure 2). One sample was collected upstream of the site and the other sample was collected downstream of the site and should show whether or not the site has impacted the ditch. Ohio EPA investigators observed that at least one foot of creosote composed the top layer of sediment in the ditch (Ohio EPA, 1993). The ditch empties into the Ottawa River several miles downstream of the site. PAH concentrations were highest downstream of the site (Figure 2). These PAHs were also elevated in soils on-site (Table 3).

TABLE 3
OFF-SITE SEDIMENT SAMPLE, WILLIAMS DITCH

CHEMICAL	CONCENTRATION (mg/kg)
Phenanthrene	**4-600**
Naphthalene	ND-69
Acenaphthene	ND-85
Benzo(a)pyrene	**3-110**
Fluoranthene	**ND-720**
Pyrene	**ND-500**
Chrysene	ND-180

(Ohio EPA, 1993)
Chemicals in bold also elevated in on-site soil

Three surface water samples were collected from Williams Ditch. Samples were collected from two upstream and one downstream stations. Low, estimated levels of benzene, toluene, xylene, and trichloroethene were detected in the surface water sample taken downstream from the site.

DISCUSSION

Former creosote operations at the Toledo Tie site has resulted in the contamination of subsurface soil at the site, sediments and surface water in a nearby ditch, and possibly groundwater in the vicinity of the site. Subsurface soil and sediments in Williams Ditch contained elevated levels of several PAHs, including benzo(a)pyrene. Although groundwater in the vicinity of the site contained elevated levels of arsenic it is unlikely that anyone would be exposed, because the City of Toledo has prohibited the use of groundwater for drinking water.

Adults and children who regularly wade in Williams Ditch (for example, every day, spring through fall) could be exposed to PAHs by skin contact with contaminated sediments. Access to Williams Ditch is unlimited. At the time of the site visit, the ditch was cloudy and turbid and had an oily sheen on the surface of the water. There was also a faint creosote odor in the air. Ohio EPA investigators observed at least one foot of creosote on top of the ditch sediments (Ohio EPA, 1993). The ditch empties into the Ottawa River several miles downstream of the site. Dermal contact with PAHs has been associated with adverse skin effects in both people and animals. Exposure to some PAHs can potentiate the skin damage that is caused by sun exposure (ATSDR, 1994). If people wade in the ditch and have contact with contaminated sediments and are exposed to the sun severe skin damage can result. Exposure to PAHs has been associated with inflammatory responses of the skin and skin lesions. Inhalation and contact with PAHs has also been associated with the development of cancer. Exposure to mixtures of PAHs has caused the development of skin tumors. Studies of this type are limited in use, because there is no quantification of exposure to individual PAHs and exposures to other carcinogens.

Investigators at the site noted that soils in the former creosote lagoons were saturated with an oily, tar-like material. Sample results indicated that two areas on site, in the former lagoon area and at the waste pile, were extensively contaminated with PAHs. There were no surface soil (0-3 inches) samples taken at the site, therefore it is not known whether or not surface soils at the site are contaminated and we are unable to assess the risks from incidental contact with surface soils. Because most of the site is covered with vegetation, incidental contact with surface soils is not likely to occur, however, people digging and building on the property could come in contact with creosote saturated soils. During the site visit, we noted that there someone was excavating south and adjacent to the Ohio Lottery building that had exposed the upper 1-2 feet of soil. Soil samples were not collected from this area, therefore, it is not known whether or not these soils are contaminated with creosote. If soil in this area is contaminated with PAHs, people could be exposed by breathing dirt and dust or ingesting dirt. Dirt can be ingested or consumed by eating food or smoking cigarettes with dirt on the hands.

CONCLUSIONS

On-site subsurface soils and sediments in Williams Ditch are saturated with creosote and extensively contaminated with PAHs. Benzo(a)pyrene was present in soils above screening levels. During the site visit, it appeared as though someone was digging a foundation next to the Ohio Lottery building on site. There were no soil samples collected in this area, therefore, it is not known if the soil in this area contained site-related chemicals. If soil in this area is contaminated with PAHs, people could be exposed by breathing dirt and dust or ingesting dirt. Adults and children who regularly wade in Williams Ditch (for example, every day, spring through fall) could be exposed to PAHs by skin contact with contaminated sediments. Access to Williams Ditch is unlimited. Ohio EPA investigators observed that at least the top foot of ditch sediments were composed of creosote (Ohio EPA, 1993). Exposure to PAHs has been associated with adverse skin effects, the development of lesions,

and skin cancer in animals and humans. Most of these studies involve the exposure to mixtures of PAHs.

Although groundwater contained elevated levels of arsenic, exposure is not likely to occur because the City of Toledo has restricted use of groundwater within the city limits. This is not specifically related to the Toledo Tie site, but due to of regional groundwater contamination.

RECOMMENDATIONS

1. Either restrict access to Williams Ditch or remove contaminated sediments to limit any possibility of exposure to creosote products.

2. Sample soil in any on-site areas currently being excavated or excavated in the future. ODH will evaluate soil data collected from these areas.

3. Collect 5 to 10 surface soil samples (0-3 inches) in the areas previously identified as contaminated with PAHs to determine the extent of surface soil contamination.

4. ODH will evaluate any additional environmental monitoring data collected at the site.

REFERENCES

Agency for Toxic Substances and Disease Registry Toxicological Profile for Polycyclic Aromatic Hydrocarbons. Draft for Public Comment, 1994.

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PREPARERS OF REPORT

Tracy Shelley, M.S.
Chief, Health Assessment Branch
Bureau of Environmental Health and Toxicology
Ohio Department of Health

Robert Frey, Ph.D
Geologist, Health Assessment Branch
Bureau of Environmental Health and Toxicology
Ohio Department of Health

S. Amanda Burkett
Epidemiologist, Health Assessment Branch
Bureau of Environmental Health and Toxicology
Ohio Department of Health

ATSDR Regional Representative

Louise Fabinski
Regional Operations
Senior Health Scientist
Region V

ATSDR Technical Project Officer
Richard Kauffman
Environmental Health Scientist
Division of Health Assessment
and Consultation, Superfund Site Assessment Branch.

CERTIFICATION

This Toledo Tie Treatment Health Consultation was prepared by the Ohio Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

Richard R. Kauffman, M.S.
Technical Project Officer
Superfund Site Assessment Branch (SSAB)
Division of Health Assessment and Consultation (DHAC)
ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation, and concurs with its findings.

for Sharon Williams-Fleetwood, Ph.D.
Chief, SSAB, DHAC, ATSDR